Credit Name: CSE 3120 Object-Oriented Programming 1
Assignment Name: My Savings Mastery
How has your program changed from planning to coding to now? Please explain?

PLANNING:
I plan to create two classes, one main My Savings class and a PiggyBank class that will add different types of coins, remove all the money from the bank, and show the bank total.

MySavings: Prepare scanner, create an object to link the PiggyBank class, and create a while loop. Inside the loop will be the menu, to add different types of coins, remove all money, show the account balance, or quit the program. The User's entered number will be stores in a choice variable, to be used in a switch statement. The switch statement will preform the appropriate actions based on what the used chose, and It will call methods from the PiggyBank class to preform the action requested.

PiggyBank: Holds the constructor method to create a new object in the main class, and also holds the methods that will add the types of coins, take all the money out, and get the total amount in the bank.

CODING:
1. My Savings Class

```
//prepare scanner for user input
Scanner input = new Scanner(System.in);
```

Scanner for user input

2. PiggyBank.java

```
private int pennies;
private int nickels;
private int dimes;
private int quarters;

//constructor method to
//default value of 0
public PiggyBank() {
    pennies = 0;
    nickels = 0;
    dimes = 0;
    quarters = 0;
}
```

Different coin types declared as integers, and in the constructor method (piggybank class) the coin types are intitalized and set to 0. This is because initially, we assume that there is no money in the bank, and the user starts to add money from the 0 mark.

3. My Savings Class

```
PiggyBank PiggyBank = new PiggyBank();

//choice variable will be used to store user input
//choice variable will be used in a switch statement to do the task o
int choice;

//while loop runs until user decides to exit with the choice 0
while (true) {

    //options that the user can choose from
    System.out.println("1. Show total in bank");
    System.out.println("2. Add a penny");
    System.out.println("3. Add a nickel");
    System.out.println("4. Add a dime");
    System.out.println("5. Add a quarter");
    System.out.println("6. Take money out of the bank");
    System.out.println("Enter 0 to quit.");
    System.out.println("Enter your choice:");

    //user input stored in the choice variable
    choice = input.nextInt();

    //if choice is option 0, end program
    if (choice == 0) {
        System.out.println("Thanks for using the Application. Bye!");
        break;
    }
```

PiggyBank object is created in My Savings main class. Choice variable is declared, which will be used to store user input and also for the switch statement that I will code in the next steps.
In the While loop, the menu is displayed giving the options to add different types of coins, remove all money, show the account balance, or quit the program.
If choice is 0, (0 means user decided to quit) thank you message is displayed and program ends.

4. PiggyBank.java

```java
public void addPenny() {
    pennies++;
}

// increases value of nickels variable by 1 (adds a nickel)
public void addNickel() {
    nickels++;
}

// increases value of dimes variable by 1 (adds a dime)
public void addDime() {
    dimes++;
}

// increases value of quarters variable by 1 (adds a quarter)
public void addQuarter() {
    quarters++;
}

// resets variable values to 0, so that there is no money left in the bank ac
public void takeMoneyOut() {
    pennies = 0;
    nickels = 0;
    dimes = 0;
    quarters = 0;
}

// calculates total by multiplying the number of coins times the value of 1 c
//all these values are then added to get the total
public double getTotal() {
    return pennies * 0.01 + nickels * 0.05 + dimes * 0.10 + quarters * 0.25;
}
```

Using the ++, it adds 1 to the variable. For the methods that addcoins, I used coinName++;
The Method takeMoneyOut resets all the variable values, so that everything is once again 0.
getTotal multiplies number of each coin type times the value each coin, then everything is added together.

5. My Savings Class

```
switch (choice) {

//show total
case 1:
    System.out.printf("Total in the Bank: $%.2f\n", PiggyBank.getTotal());
    break;

//add penny
case 2:
    PiggyBank.addPenny();
    System.out.println("Added a penny.");
    break;

//add nickel
case 3:
    PiggyBank.addNickel();
    System.out.println("Added a nickel.");
    break;

//add dime
case 4:
    PiggyBank.addDime();
    System.out.println("Added a dime.");
    break;

//add quarter
case 5:
    PiggyBank.addQuarter();
    System.out.println("Added a quarter.");
    break;

//take all money out of the bank
case 6:
    PiggyBank.takeMoneyOut();
    System.out.println("All money has been removed from the bank.");
    break;

//default switch statement
default:
    System.out.println("Error, Please try again.");
}
```

Finally, I used a switch statement. The user input number is the case number, and the appropriate case will run when selected. Case 1 prints the total amount in dollars and to two decimal places. The method getTotal is called to from PiggyBank.java to get the total amount.
Case 2-5 use the same format, calling the appropriate method from PiggyBank.java to add a coin, and then printing that the coin has been added.
Case 6 calls the takeMoneyOut method, which resets the total amount in the bank to 0.
It then prints that all money has been taken out.
Default statement incase there is a user error.

End Of Program!